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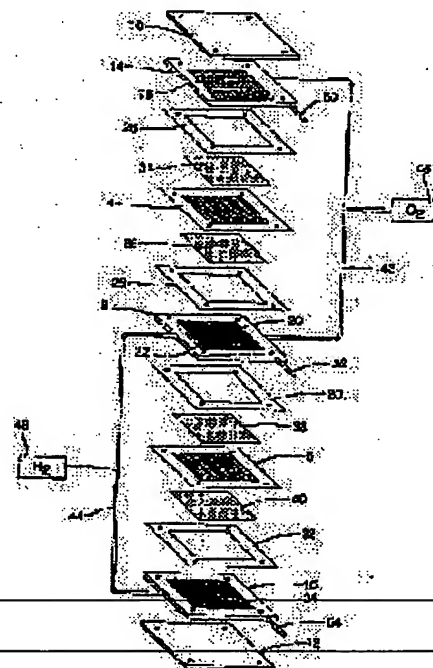
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(54) FIBER ORIENTATION ADJUSTED SEPARATOR PLATE FOR FUEL CELL, AND MANUFACTURING METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a composite separator plate for a fuel cell, in which carbon component is a small quantity and polymer component is a large quantity.

SOLUTION: A separator plate composition contains a specified ratio of conductive fibrous fillers, having relatively high aspect ratio oriented in the direction passing through the thickness of the plate, in order to obtain the specified electrical conductivity and thermal conductivity. The manufacturing method of the separator plate, in which the fibers are oriented so as to pass through the plate surface contains a process forming the separator plate having land height and a process obtaining the desired geometric shape of the separator plate, by removing a part of the land height.



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3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] the compound separator plate with the 1st front face in which two or more flow paths were formed, and the 2nd front face of the opposite side of this 1st front face for fuel cell stacks — it is — the polymer ingredient of 50 capacity % thru/or 98 capacity %, and the fiber of 2 capacity % thru/or 50 capacity % — a conductor — containing — said fiber — the compound separator plate with which, as for the conductor, the effective resistance of said compound separator plate is arranged by the orientation to which it pierces through a plate side so that it may become two or less 50 milli ohm cm.

[Claim 2] For current density, by the orientation which pierces through said plate side, fuel cell pile pressures are about 137.2 N/cm² at about 1.0075 A/cm² between said 1st front face and said 2nd front face of said separator plate. Compound separator plate according to claim 1 which brings about a voltage drop 50mV or less on conditions.

[Claim 3] the fiber arranged by the orientation whose 20 capacity % thru/or 40 capacity % 60 capacity % thru/or 80 capacity % are formed with a polymer ingredient, and pierces through said plate side — the compound separator plate according to claim 1 currently formed with the conductor.

[Claim 4] said polymer ingredient — a polymer — the compound separator plate according to claim 1 which is a conductor.

[Claim 5] a non-fiber — the compound separator plate according to claim 3 which contains a conductor below 10 capacity %.

[Claim 6] said non-fiber — the compound separator plate according to claim 5 chosen from the group which a conductor becomes from carbon black, graphite fine particles, and metal fine particles.

[Claim 7] Said polymer ingredient is a compound separator plate according to claim 1 chosen from the group which consists of thermosetting polymer and a thermoplastic polymer.

[Claim 8] Said polymer ingredient is a compound separator plate according to claim 7 chosen from silicone, a polyisobutylene, epoxy vinyl ester, and the group that consists of phenol resin.

[Claim 9] Said polymer ingredient is polypropylene, ETFE, nylon, and a compound separator plate according to claim 7 chosen from the group which consists of rubber reforming polypropylene.

[Claim 10] said fiber — a conductor — a restoration object — an aspect ratio — 10:1 or more fibers — the compound separator plate according to claim 1 which is a conductor.

[Claim 11] said fiber — a conductor — the aspect ratio of about 40 capacity % — 15:1 or more PAN(s) Compound separator plate according to claim 10 which is MF30 carbon fiber.

[Claim 12] said fiber — the compound separator plate according to claim 10 chosen from the group which a conductor becomes from carbon fiber, a graphite fiber, the graphite fiber coated with nickel, and stainless steel fiber.

[Claim 13] The compound separator plate according to claim 1 which contains the fiber nonconductor below 10 capacity % further.

[Claim 14] said fiber — the 2nd conductivity textile materials with which a conductor differs the 1st conductivity textile materials from 1 capacity % thru/or 25 capacity %, and said 1st conductivity textile materials — 1 capacity % thru/or the compound separator plate according to claim 1 25 capacity % included.

[Claim 15] For said 1st conductivity textile materials, the aspect ratios of about 15 capacity % are 100:1 or more pie log roughs. It is PR-11 graphite fiber and, for said 2nd conductivity textile materials, the

aspect ratios of about 5 capacity % are 15:1 or more PAN(s). Compound separator plate according to claim 14 which is MF30 carbon fiber.

[Claim 16] the non-fiber of about 5 capacity % — the compound separator plate according to claim 15 which contains a conductor further.

[Claim 17] said non-fiber — the compound separator plate according to claim 16 chosen from the group which a conductor becomes from carbon black, graphite fine particles, and metal fine particles.

[Claim 18] the fiber of the polymer ingredient of 50 capacity % thru/or 98 capacity %, 2 capacity %, or 50 capacity % — with the process which blends the composite material containing a conductor Said composite material is fabricated between the 1st shaping side which has a crevice for the 1st land, and the 2nd shaping side which has a crevice for second lands. It is the process which forms a separator plate. This separator plate the second land prolonged in second-land height from the 2nd page, the 1st land prolonged in the 1st page to the 1st land height of said separator plate, and said separator plate, — containing — said fiber — a conductor this fiber — the amount of [of a conductor] part I arranges to said 1st land — having — said fiber — with the separator plate formation process oriented so that a part for part II of a conductor may be arranged at said second land Said a part of 1st land [at least] is removed, said 1st land height is decreased by this, and the 1st disclosure side is formed. This 1st disclosure side said fiber which approaches with said 1st disclosure side and carries out termination — with the process which has the edge for said part I of a conductor said fiber which said a part of second land [at least] is removed, said second-land height is decreased by this, the 2nd disclosure side is formed, and this 2nd disclosure side approaches with said 2nd disclosure side, and carries out termination — the manufacture approach of a compound separator plate including the process which has the edge for said part II of a conductor.